

THE AUSTRALIAN PLANT DISEASE RECORDER.

Volume 7. Number 4.

October. 1955.

Edited by:

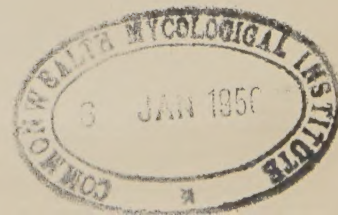
K.E.Hutton, Biological Branch,
Department of Agriculture,
Box 36, G.P.O., Sydney.

I N D E X.

<u>PLANT DISEASE NOTES.</u>	Page
Cereals and Grasses	41
Field and Fodder Crops	43
Vegetables	48
Fruit	50
Ornamentals	54
<u>MISCELLANEOUS NOTES</u>	55

---oOo---

For private circulation to plant pathologists within
Australia.



PLANT DISEASE NOTESCEREALS AND GRASSES.TURF DISEASES ON SYDNEY GOLF COURSES:

The two main diseases on golf greens in the Sydney metropolitan area are brown patch (Rhizoctonia solani) and dollar spot (Sclerotinia homoeocarpa).

Both of these diseases are capable of killing the grass and causing bare areas to appear on the greens, with a consequent unevenness of the playing surface. They are most active from November to March, brown patch being favoured by the higher temperatures.

The standard recommendation in New South Wales for brown patch control is a mixture of corrosive sublimate and calomel in the ratio of 1 : 1 applied at monthly intervals at the rate of 3 ozs in 50 gallons of water per 1,000 square feet. The cadmium compounds which are usually applied at fortnightly intervals are recommended for control of dollar spot.

The cost of control of these diseases over the 18 greens of a golf course using the above treatments is very high. In an endeavour to determine whether this cost can be reduced without impairing the degree of control achieved, three statistically designed fungicide testing experiments were carried out on six Sydney golf courses during the 1954-55 summer.

In these experiments each plot of 1,000 square feet was treated with the appropriate fungicide in 10 gallons of water applied by means of a watering can.

The grass in all cases was Agrostis tenuis and the incidence of both diseases during the season was outstandingly high. Counts per plot of dollar spot lesions ranged from 0 - 3,000 and of brown patch from 0 - 350 (these varied in diameter from 3 in. to 30 in.)

The results assessed on counts of lesions are indicated in the following table. Control was rated on a 0 to 10 basis; 0 indicating complete control of the disease and 10 indicating a spread of the disease with no apparent control.

Treatment	Application	Rate/1,000 sq. ft.	Rating for disease control	
			Dollar spot	Brown patch
$H_gCl_2 + H_gCl$	monthly	3 ozs	1.5	2
H_gCl_2	monthly	2 ozs	3.5	5
H_gCl	monthly	2 ozs	4.0	7.5
Calomel alternated with "Puraturf" 177, 3 weekly		2, $1\frac{1}{2}$ ozs	4.0	8.0
Thiram	fortnightly	2,3,4 ozs	10	10
Control			10	10

Injury and retarding effect of fungicide treatments on Agrostis tenuis were observed during the course of the experiments. The mercury treatments had a retarding effect on growth while thiram appeared to improve the colour of the grass.

The residual effect of corrosive sublimate was equivalent to that of calomel.

Before analysing these experiments for significance another set of experiments will be conducted during the 1955-56 summer to see if the same trend in disease incidence and severity is repeated.

- D. REILLY.

Dept. of Technical Education,
Sydney.

Date of birth: 1900
 Date of death: 1950
 Date of burial: 1950

1	1900	1950	1950
2	1900	1950	1950
3	1900	1950	1950
4	1900	1950	1950
5	1900	1950	1950
6	1900	1950	1950
7	1900	1950	1950
8	1900	1950	1950
9	1900	1950	1950
10	1900	1950	1950

The following is a list of the names of the persons who were born in the year 1900 and died in the year 1950. The names are listed in alphabetical order.

The following is a list of the names of the persons who were born in the year 1900 and died in the year 1950. The names are listed in alphabetical order.

The following is a list of the names of the persons who were born in the year 1900 and died in the year 1950. The names are listed in alphabetical order.

List of names of persons who were born in the year 1900 and died in the year 1950.

FIELD AND FODDER CROPS.DISEASE IN SUBTERRANEAN CLOVER:

Surveys have revealed the presence in Victoria of a disease in subterranean clover apparently similar to that reported from New South Wales (J. Walker, A.P.D.R. 7 : 3 : 26, 1955).

The disease has occurred in widely separated areas in Gippsland, North-eastern and central districts and, in some instances, approximately 80-90% of plants in a stand were affected. It appeared at first that the disease was most prevalent in newly sown areas but subsequently was found in established pastures.

Mt. Barker was the variety most commonly affected, but the trouble was by no means confined to this variety.

What appear to be typical symptoms of the disease have also been observed in suckling clover, cluster clover, red clover, spotted medic and some other unidentified medics.

The symptoms somewhat resemble those of a nutrient deficiency, particularly magnesium deficiency. However, in one field experimental plot, dressings of up to 1 cwt./ac. of magnesium sulphate had no effect on its incidence. Also, infected plants have been established in complete nutrient solutions in the glasshouse. Although these plants have since made new growth, there has been no evidence of recovery from the disease.

Transmission tests to determine whether the disease is caused by a virus are in progress.

- C. R. MILLIKAN.

Department of Agriculture,
Melbourne.

SCLEROTINIA DISEASE OF CLOVER:

A disease caused by a species of Sclerotinia has caused severe damage to irrigated pastures at Kyabram, Tatura and Cobram in the northern district of Victoria.

The species commonly affected has been white clover, although in one instance the disease occurred in red clover.

The damage has been confined to pastures which had been shut up throughout the winter and had consequently produced a dense sward. The collapse of the plants was preceded by a dense growth of white mycelium along the ground under the sward. The rotting appeared to be confined to the aerial parts of the white clover, as new shoots were produced from the runner stems following the collapse of the plants, or grazing of the pasture.

The widespread distribution of the disease suggested that it has been present in the area in a mild form in previous seasons, but has caused more severe damage this year due to the occurrence of very favourable weather conditions.

- C. R. MILLIKAN.

Department of Agriculture,
Melbourne.

SCLEROTINIA ON CLOVER:

During July of this year, two sods of white clover were submitted to this laboratory, for identification of a "white slimy mould," which was reported to be causing considerable damage to the pasture concerned. The first specimen came from Kyabram, 124 miles north, and the second from Cobram, 155 miles north-east, of Melbourne.

The fungus isolated from the Kyabram pasture grew a little faster than the Cobram isolate, but otherwise the two isolates were identical, agreeing in cultural characters with Sclerotinia trifoliorum, as described by M. A. Keay (Annals of Applied Biology 26: 227-246, 1939.)

When comparison was made with a Victorian isolate of Sclerotinia sclerotiorum, the clover isolates could be clearly differentiated from this species, by the following characteristics of growth on 5% malt extract agar at 20°C.

1. Unlike S. sclerotiorum, the sclerotes were not covered by a fine web of hyphae.
2. In petri-dish cultures, on the margin of the colony, small sclerotes developed which tended to fuse and form a black ring lining the wall of the dish. In test tube cultures, somewhat similar but larger bodies, known as "haptera," were formed in contact with the glass. Structures of this kind were not found in cultures of S. sclerotiorum.
3. There was profuse development of microconidia from the surface of "haptera" after approximately six weeks' growth in tube cultures. In cultures of S. sclerotiorum, microconidia were not observed. Investigations are being continued with the object of confirming this diagnosis of S. trifoliorum from clover on the basis of apothecial characters.

- EILEEN E. FISHER.

Department of Agriculture,
Melbourne.

SCLEROTINIA DISEASES OF CLOVERS IN NEW SOUTH WALES:

During August this year, three records of clover being attacked by Sclerotinia - like fungi were made for the first time in New South Wales. At Upper Orara, on the north coast, white clover (Trifolium repens) and red clover (T. pratense) were severely attacked, up to 90% of plants being killed in some patches. These were 1ft. to 1½ ft. in diameter and had sometimes joined up to form irregular dead areas. Cocksfoot (Dactylis glomerata) and rye grass (Lolium sp.) were growing quite well in these patches. At Deniliquin in the south-west, the leaves of white clover in an irrigated clover-perennial rye grass pasture were rotted. White fungal mycelium could be seen on the dying plants and making limited growth over plant debris on the ground. The rye grass (L. perenne) was generally free from attack but some rotting did occur where a leaf came into contact with a rotted clover leaf. The third record was from Leeton, in the Murrumbidgee irrigation area, where crimson clover leaves were rotted. About 5-10% of plants in a clover nursery were affected and black sclerotia were seen amongst the rotted foliage.

In culture, the clover isolates differ from Sclerotinia sclerotiorum isolates in several respects and also show quite marked differences from one another. At present work is being carried out on their host range and on their behaviour under various cultural conditions. Attempts are being made to produce apothecia to allow species identification. The results of this work will be reported later.

The author would be grateful for any records of Sclerotinia-like fungi on clovers in Australia and for cultures of any Sclerotinia spp. (with host and locality details) for comparison with New South Wales isolates,

- J. WALKER

Department of Agriculture,
Sydney.

BURN OF WHITE CLOVER:

Specimens of white clover from Deniliquin were showing the development of many minute black leaf spots and occasionally larger brown lesions. On these larger lesions, perithecia of a fungus identified as Sphaerulina trifolii Rostr were found. The organism was isolated and cultural characteristics agreed with those of S. trifolii, this being the first record of this Fungus on white clover in N.S.W. It was recorded previously on Medicago denticulata from Pennant Hills (A.P.D.R. 7:2:17, 1955).

- J. WALKER

Department of Agriculture,
Sydney.

VEGETABLES.A BACTERIAL DISEASE OF CRUCIFERS:

During the winter months this season several specimens of crucifers were received, from which a bacterium was isolated. The hosts were cauliflower, Brussels sprouts, chou moellier and turnip. The symptoms on the Brassicas were typical of those caused by the black rot organism, Xanthomonas campestris, and the bacterium isolated conformed with the cultural characteristics of Xanthomonas.

The turnips exhibited a spotting and yellowing of the leaves and a rotting of the roots. Isolates from turnip were similar to those from cauliflower and Brussels sprouts. Inoculations were made into young cabbage plants and the symptoms produced by the isolates from turnip and Brussels sprouts were identical. So far it has not been possible to reinfect growing turnips.

Seed was obtained from the same source as that used to sow some of the infected crops. This was sown in a pot of sterilized soil and 85% of the young seedlings damped off. The bacterium was re-isolated from these. This investigation is being pursued as the outbreak is unusual and X campestris has not been recorded previously on turnip in Tasmania. The distribution of the disease on the north-western coast indicates a possible origin in a particular lot of seed.

The outbreak of this disease in field turnips caused damage of considerable economic importance. From one district in the Devonport area reports were received from five growers whose losses totalled 34 acres. These were the only figures supplied, but the disease was reported from other areas.

- GWENDA CARTLEDGE.

Department of Agriculture,
Hobart.

DOWNY MILDEW OF CAULIFLOWERS:

A serious outbreak of Peronospora parasitica occurred in a Hobart suburban market garden in August this year. This disease usually only damages the outer leaves and is not severe enough to warrant any special attention. In this case, however, approximately one acre of cauliflowers were so affected that the majority were unsaleable. The leaves of many were dried out, dead and papery while still wrapped round the curd, which, in such plants, was brown. These plants were then susceptible to secondary rots. The leaves of less severely affected plants showed the black stippled upper surface corresponding to areas of mould on the lower surface. Many leaves were badly stunted and distorted, and curd development was severely checked.

- GWENDA CARTLEDGE.

Department of Agriculture,
Hobart.

FRUIT.LEMON CRINKLE VIRUS:

Lemon crinkle virus (A.P.D.R. 6:2:6:1954) had, up till the end of 1954, been recorded in two orchards in N.S.W. Subsequent enquiry showed that budwood had been cut in one of these orchards and some distribution of the disease occurred. More recently the disease has been found in a third orchard at Somersby, N.S.W., where also budwood has been cut. Some distribution of diseased trees has been traced. A tree by tree survey of lemons for this somewhat elusive disease is out of the question at present, but protection of growers is necessary. In view of this it has been decided to bring lemons within the scope of the citrus bud certification scheme in N.S.W.

- LILIAN R. FRASER.

Department of Agriculture,
Sydney.

LEMON CRINKLE, SEEDLING SYMPTOMS:

Fawcett (in Citrus Industry, Vol. 2) has included lemon crinkle as a possible psorosis disease on the basis that where infected trees are on sweet orange stock, the stock usually shows psorosis symptoms. Inoculations to seedlings have not confirmed this. Seedling sweet orange and mandarin varieties show a transient and mild crinkle and an occasional star-like leaf fleck but no trace of psorosis pattern. Eureka and other lemon seedlings show quite a strong development of star-like flacks in the leaf mesophyll 5-6 weeks after inoculation. Leaves formed subsequently are crinkled.

At the Gosford Citrus Experiment Station a number of crinkle-infected lemons are on sweet orange stock. None of these stocks shows any symptoms of psorosis.

- LILIAN R. FRASER.

Department of Agriculture,
Sydney.

LEAD ARSENATE INJURY ON APPLE LEAVES:

In two separate orchard spray trials a considerable necrosis of apple leaves was noticed following the application of thiram and lead arsenate together or lead arsenate alone. The injury occurred following sprays applied in early December. There was no evidence that lead arsenate or thiram and lead applied earlier than this caused any damage.

The injury took the form of necrotic spots about $\frac{1}{8}$ in. in diameter, mostly concentrated near the margin of the leaves and often running into one another. In appearance the spots are barely distinguishable from "frog eye" spots attributed to Sphaeropsis malorum. In recent years it is probable that Sphaeropsis has been blamed for thiram-lead arsenate injury in Tasmania. Injury occurred rather more on old leaves around fruit clusters than on younger leaves on laterals.

These observations were made on Scarlet and Sturmer. On the block of Scarlet injury was quite severe where lead arsenate was applied on its own, but it appears that when thiram is applied as well, damage may be more severe. No injury followed the use of thiram alone, or of a mixture of thiram, lead arsenate and colloidal sulphur. On Sturmer injury occurred only when lead arsenate was combined with thiram (it was not applied on its own). Other fungicides used in the trial, namely, ziram, zineb, captan, P.M.F., colloidal sulphur and Karathane appeared to make the lead arsenate "safe" as no injury occurred.

No fruit injury was observed, even on the particularly sensitive variety Scarlet.

- J. R. WARD.

Department of Agriculture,
Hobart.

BACTERIAL CANKER OF STONE FRUITS:

The results of a bacterial canker (pseudomonas syringae van Hall) control experiment using streptomycin on Ron's Seedling cherries (planted 1954) at Orange were assessed late in September, 1955. Infection was at a very low level, there being only five minor infections in the forty-two untreated trees. On the plots receiving the maximum schedule of streptomycin sprays (i.e. streptomycin sulphate 100 p.p.m. applied every two weeks for twelve months) there were two minor infections, each involving only one bud. It was therefore not possible to assess, from this experiment, the value of streptomycin for the control of bacterial canker in the orchard.

- K.E. HUTTON.

Department of Agriculture,
Sydney.

CUCUMBER MOSAIC VIRUS IN PASSIFLORA SPP:

Woodiness of passion fruit is very widespread in Victoria and recent work on similar lines to those reported by C.J. Magee (A.P.D.R. 7:3:35, 1955) also suggests that this disease is caused by cucumber mosaic virus.

A virus has been transmitted from Passiflora edulis and P. caerulea to spinach using the short feed technique with Myzus persicae as vector. Both the Passiflora host plants showed a marked yellow spot mottle and distortion of the leaves. The symptoms produced on spinach were similar to those caused by the strain of cucumber mosaic virus which commonly affects spinach and lettuce in the Melbourne metropolitan area.

Attempts to transmit this virus from P. edulis to spinach mechanically have always failed, but it is readily transmitted from P. caerulea to spinach by mechanical means.

The virus thus isolated on spinach is readily transmitted from spinach back to P. caerulea and P. edulis using Myzus persicae as vector, but not so readily by mechanical inoculation, although this has been achieved in three plants out of ten. If the test plants of P. edulis are small, (no larger than the first true leaf stage) the symptom induced on the cotyledons is a yellow spot mottle with marked down-curving; this is followed by death in a number of cases. In the case of small P. caerulea test plants, chlorosis occurs with twisting of the lamina of the first true leaf.

- R. H. TAYLOR.

Department of Agriculture,
Melbourne.

PRATYLENCHUS SP. AND ROOT ROT IN STRAWBERRY:

Recent work has revealed that it is most probable that a commonly occurring root rot of strawberry in Tasmania is not caused primarily by fungi as was once thought, but by nematodes.

The Ettersburg variety is the most susceptible to this disease, which causes sudden wilting and death, following destruction of the fibrous roots. Isolates of Cylindrocladium scoparium, Fusarium spp., Pythium sp., and Rhizoctonia solani are commonly obtained from the roots and it was thought that the condition was due to attack by a complex of these and/or other fungi.

However, when soil from the roots of plants in two affected areas was examined for nematodes a high population of Patylenchus sp. was found (in excess of 5000 per pound of soil). This is almost certainly P. penetrans and the primary cause of the root rot condition.

An experiment on control by soil injection with D.D. and E.D.B. is in progress.

- I.D. GEARD.

Department of Agriculture,
Hobart.

ORNAMENTALS.ANTIRRHINUM RUST:

1955 Antirrhinum rust (Puccinia antirrhini) was found, in late September, 1945, in a home garden in the Perth metropolitan area. The plant was very severely affected and this is the first record of the disease occurring naturally in Western Australia.

A survey of its incidence is being made.

- H.L. HARVEY.

Department of Agriculture,
Perth.

NEW GERANIUM DISEASES IN NEW SOUTH WALES:

Two diseases of bedding geraniums have been recorded recently for the first time in N.S.W. One is black rot, which is caused by the soil inhabiting fungus Pythium splendens. This fungus causes a firm, dark rotting of the stem which gradually progresses towards the tip until the whole stem is black and defoliated. Cuttings are also severely attacked by the fungus.

The other record is of a bacterial leafspot, possibly caused by Xanthomonas pelargoni. The leaf spots are brown, circular and concentrically zoned. Some coalesce and kill a large area of the leaf. The bacteria also attack stems and petioles causing a black soft rot, but the leaves above the rotted stem may remain alive for some time after the blackening appears.

- VINLEIGH JOHNSON.

Department of Agriculture
Sydney.

MISCELLANEOUS NOTES.TRANSMISSION OF BROAD BEAN WILT VIRUS BY MYZUS PERSICAE SULZ:

At the Plant Diseases Conference held at Hawkesbury Agricultural College from 27th June to 1st July, 1955, enquiries were made by some delegates with regard to the identity and insect transmissibility of the broad bean wilt virus described by the writer (J. Vic. Dept. Agric. 45: 323-332, 1947) who reported failure to transmit the virus experimentally with Macrosiphum spp. and Aphis rumicis (L).

As the experiments reported were on a small scale and carried out with non-fasted insects, it seemed desirable to conduct further insect transmission work.

With this objective, broad bean plants were sap inoculated with desiccated type cultures five and seven years old respectively, which had been prepared according to the method described by McKinney (Phytopath. 37: 139-142, 1946) and stored in a domestic refrigerator. Seven of ten plants inoculated with the five-year old culture developed typical top necrosis symptoms, whereas none was infected with the older culture.

Broad bean and subterranean clover test plants were then inoculated with groups of five adult Myzus persicae starved for a minimum period of three hours, before a virus acquisition feed of 10-15 seconds duration on one of the above infected broad bean plants. These plants were approximately 6 in. high when inoculated and the clover plants (var. Mt. Barker) were in the first trifoliate leaf stage.

Four broad bean plants of ten inoculated developed typical top necrosis symptoms and three out of five sub. clover plants were infected. Equal numbers of controls remained healthy.

Also, five broad bean plants were inoculated with M. persicae bred on an infected plant. These aphids were taken from a naturally infected plant with early wilt symptoms, which was left at the laboratory for disease diagnosis. One of the plants inoculated from this source became infected.

The symptoms in subterranean clover consist of a general dwarfing of the plants, associated with a reduction in leaf size. Individual leaves become puckered and some mottling is evident. In a few leaves an extreme reduction in size of one of the leaflets has occurred.

At the time of writing one plant has developed a marginal reddening of the older leaves.

The insect transmission evidence for the broad bean virus would appear to exclude the possibility of a relationship with the tobacco ringspot virus, which it resembles in physical properties, and symptom expression on mutual hosts.

It is suggested that the virus be referred to as the broad bean wilt virus until serological investigation clarifies its relationship with the tobacco ringspot virus.

- L. L. STUBBS.

Department of Agriculture,
Melbourne.

FLUORINE DAMAGE TO VEGETABLE CROPS:

During July of this year several market gardeners and home gardeners on the eastern shore of the Derwent River opposite to the Electrolytic Zinc Works reported an unfamiliar disorder on a range of crops. Affected plants included lettuce, broad beans, radish, silver beet, onion and shepherd's purse and Rhagodia nutans. The symptom common to all species was the development of extensive silvery patches on the leaves. Lettuces were the most severely affected and badly damaged plants ceased growth. However, most plants had recovered and growth subsequent to the damage was normal. Cabbages and cauliflowers growing in the affected areas did not show damage.

Shortly after these reports Dr. Went from the California Institute of Technology, visited Tasmania and in discussion he described experiences with fluorine damage to crops in the U.S.W. As his description resembled the symptoms that had been noted, the opportunity was taken of showing him the affected crops. Dr. Went considered that there was no doubt that the symptoms were due to fluorine damage.

On enquiries at the Electrolytic Zinc Works it was found that in the present method of manufacture of superphosphate approximately 100 lb. of fluorine is liberated into the atmosphere per day. Under normal conditions this quantity is rapidly dispersed and the concentration reduced below toxic level. However, it appeared that approximately 2 months before the damage was examined by Dr. Went, unusual air currents had carried the gases downwards and across the river, so that sufficient concentrations to cause damage reached properties up to two miles from the works.

The company advised that it will shortly be changing to a different method of manufacture, and efficient scrubbers will be installed to remove fluorine from the exhaust gases.

- G. C. WADE.

Department of Agriculture,
Hobart.

NEMATODE DAMAGE TO TREE SEEDLINGS:

During July, 1955, an outbreak of root knot nematode (Meloidogyne sp.) occurred at the Forest Amenity Nursery at Dubbo, affecting both open bed and tubed seedlings.

Plants attacked were:-

Ash	<u>Fraxinus excelsior</u> L.
Boomeralla	<u>Myoporum montanum</u> R.Br.
Kurrajong	<u>Brachychiton poulineum</u> R. Br.
Pepper	<u>Schinus molle</u> L.
White Flowered Dolichos	<u>Dolichos lignosus</u> L.

The trouble was quite severe in the first three species.

The following seedlings growing in the same soils were apparently unaffected:-

Wallowa	<u>Acacia calamifolia</u> Sweet
Golden Glow	" <u>cultriformis</u> A. Cunn. ex G. Don
Eucalypts	<u>Eucalyptus</u> spp.
Red Bottle Brush	<u>Callistemon citrinus</u> (Curtis) Skeels
Pines	<u>Pinus</u> spp.
Poplars	<u>Populus</u> spp.

After burning all nursery stocks held, the area was sterilized with ethylene dibromide using a hand operated soil injector. It is proposed to adopt routine measures to shock further outbreaks of this disorder.

- D. W. EDWARDS

Forestry Commission,
Sydney.

REPORT ON THE PROGRESS OF THE WORK

During the year 1937, an attempt was made to determine the effect of the various factors on the rate of reaction, and the results are given in the following tables.

Table 1. Effect of temperature on the rate of reaction.

Temperature (°C)	Rate of reaction (g./hr.)
20	0.12
25	0.18
30	0.25
35	0.35
40	0.50

Table 2. Effect of concentration on the rate of reaction.

Concentration (g./hr.)	Rate of reaction (g./hr.)
0.1	0.12
0.2	0.18
0.3	0.25
0.4	0.35
0.5	0.50

Table 3. Effect of catalyst on the rate of reaction.

Catalyst	Rate of reaction (g./hr.)
None	0.12
Platinum	0.18
Palladium	0.25



